

FIG. 1

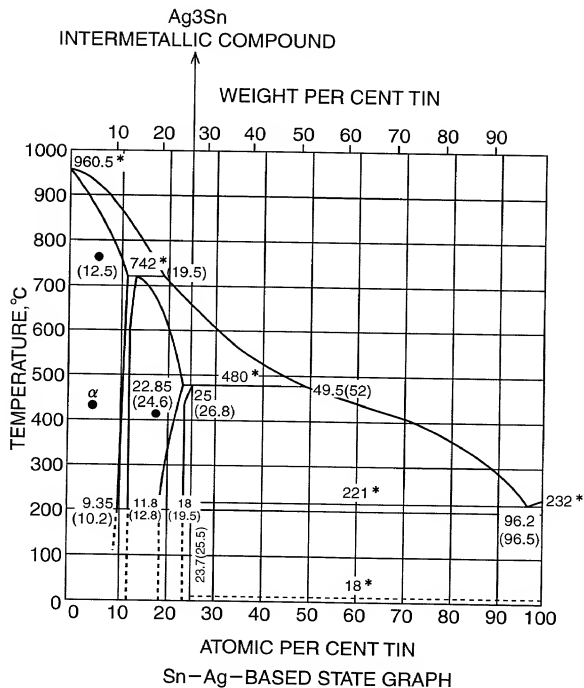
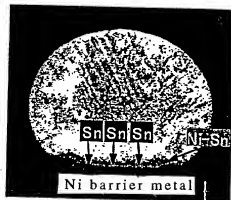


FIG. 2



REACTION AT THE BONDING INTERFACE

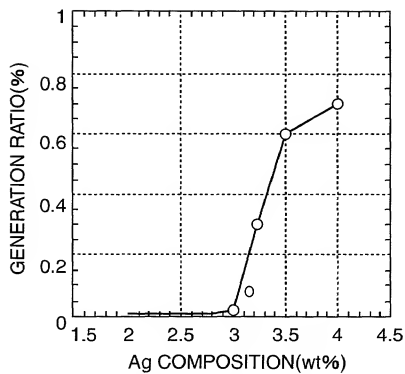
6σ VALUE IS CALCULATED
FROM THE NORMAL DISTRIBUTION.

IN CONSIDERATION OF THE Sn REDUCTION
IN THE SOLDER MATERIAL AT BONDING.



UPPER LIMIT OF Ag COMPOSITION

FIG. 3



PROJECTION SHAPE GENERATION RATIO IN THE SOLDER ALLOY
OF EACH Ag COMPOSITION

FIG. 4A

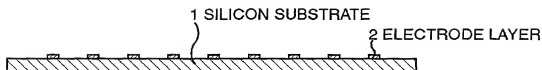


FIG. 4B

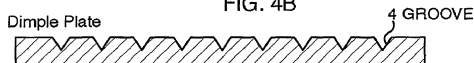


FIG. 4C

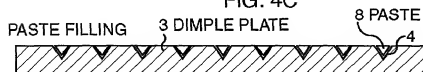


FIG. 4D

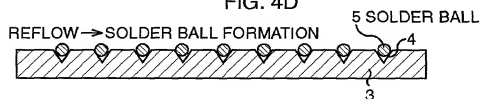


FIG. 4E

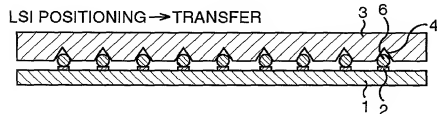


FIG. 4F

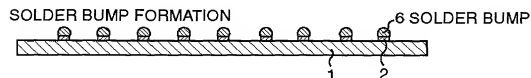
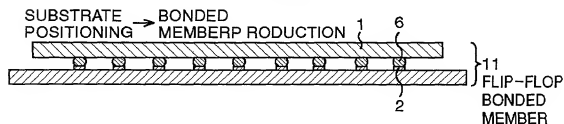


FIG. 4G



DIMPLE METHOD STEPS AND FLIP-CHIP BONDING STEPS

FIG. 5

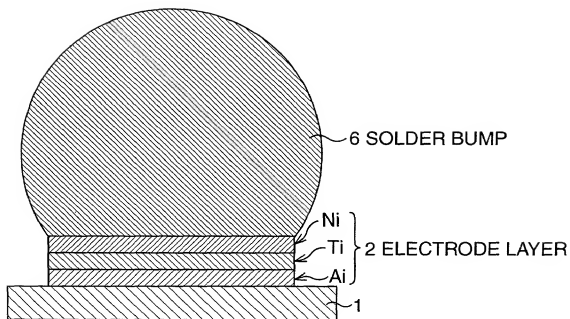
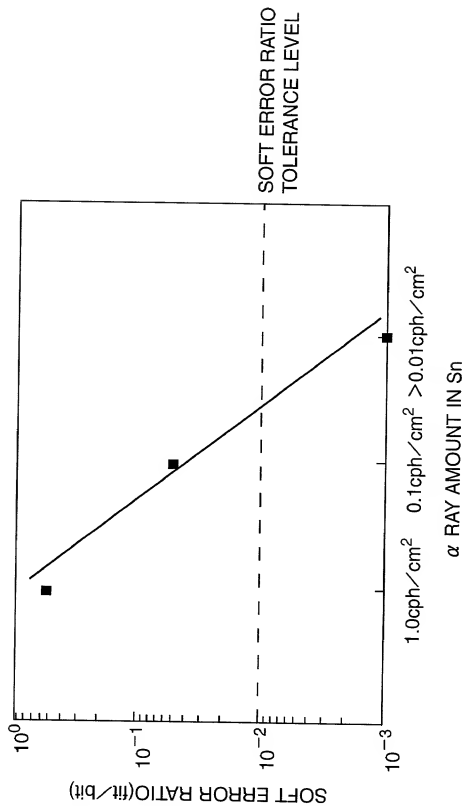
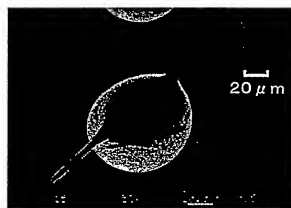


FIG. 6



α RAY AMOUNT IN SOLDER MATERIAL AND THE SOFT ERROR RATIO IN DEVICE

FIG. 7



PROJECTION SHAPE